Exploring Knowledge Acquisition and Sharing Strategies: A Qualitative Study from Pakistan Football Industry

Muhammad Zaheer, Muhammad Rizwan Saleem Sandhu
1,2 Department of Management Sciences, Virtual University of Pakistan
*Corresponding Email: mzaheer@vu.edu.pk

ABSTRACT

This study has explored the knowledge acquisition and sharing processes operative in the football industry of Sialkot, Pakistan. This study has focused on how these firms could adopt new means of technologically advanced football processes. Knowledge acquisition, dissemination, and conversion have remained unexplored in the football production processes. The qualitative research methodology was used, and the grounded theory approach was applied. Using semi-structured interviews, data were collected from 15 informants, including CEOs, managers, and owners. Purposive sampling was used to select the informants. This was a cross-sectional study with an inductive approach. Gioia (2013) methodology was used to analyze the data in grounded theory. Data structure developed from the interviews produced three aggregate dimensions, namely strategic position, knowledge acquisition & strategic fit, and knowledge sharing. Data analysis reveals that football producing firms have invented state of the art technology and upgraded their operations according to the changing production requirements. These firms have earned a competitive advantage based on their dynamic capabilities, research & development, innovation, and rich history of football production.

Keywords:
Football production, Knowledge acquisition and sharing, Qualitative research

JEL Classification:
J24, M12

Introduction

Football is the most popular sport globally, played in almost every corner of the world. The Football world cup is held every four years by the Federation Internationale de Football Association, better known as FIFA. FIFA world cup is the most followed sports event. Football has the highest fan following and the largest playing body and officials (FIFA, 2019). A survey from 18 markets, including the Americas, Europe, the Middle East, and Asia, revealed that more than 40% of the world population is interested in football, making it the number one sport (Nielsen, 2018). According to Nielsen (2018), 736 million people, who account for 43% of the surveyed population, like football. According to FIFA (2007), 265 million people (males and females) play football, and 5 million referees and officials are active in football, which means 270 million people, which account for 4% of the world population, are involved in football. This number is on the rise without any doubt. Interest in football has been increasing in nations across the globe.
For such a popular sport, the production of footballs has been concentrated in a few countries, namely Pakistan, China, Vietnam, Thailand, and India (Chan et al., 2015; Ohri, 2018). For decades Pakistan has dominated football production with an uncontested market share. Till 2006, Pakistan was producing 80 percent of the world’s footballs (Montero, 2006). As reported by Siegmann (2008), Pakistan has been the primary supplier of footballs to the USA and Europe till the mid-90s. All the football production is being carried out in one city of Pakistan, Sialkot (Chan et al., 2015).

There are certain skills and competencies that are involved in football production, and firms in Sialkot possess peculiar knowledge of football production. This is very important to know what skills and knowledge provide these firms a competitive advantage over their global counterparts. Moreover, these firms have kept on adding more knowledge and skills to the core competencies.

There have been many studies on football; most of these studies have been on different aspects of football like the football game tactics, knowledge of the game, players’ physique, clubs or associations, quality of the football, and working conditions of the labor. None of these studies focused on the knowledge acquisition, storage, or dissemination among the workers and the football manufacturing firms. The tacit and explicit knowledge possessed by the workers and the firms and the mechanics of knowledge acquisition and sharing are still untapped. This study bridges this gap and focuses on knowledge acquisition and sharing in football producing firms.

**Literature Review**

**Evolution of Football Production In Sialkot**

The origin of football production in Sialkot dates back to 1889; as cited by Atkin et al. (2017), a British soldier took his punctured football to a local cobbler named “Fazal Elahi” for repair. The next day, the repaired soccer ball was ready to be used. The soldier thanked the cobbler and paid much more than the poor cobbler’s expectations (Chattha, 2011). Cobbler wished to see him again, and it was not so long when the same soldier came again with a deflated ball; this time, to his surprise, the cobbler presented a brand new football. The soldier was pleased and impressed to find a brand new
football that could last longer (Pinsker, 2014). The skills of the cobbler enabled him to imitate perfectly and thus became the football provider to the British army. Impressed by his work and progress, other community members also approached him and offered their services to fulfill the demand he was finding difficult to meet. So, here started the journey of the hand-stitched football in Sialkot, which is almost 131 years old.

After the creation of Pakistan in 1947, Sialkot workers’ skills kept on building upon previous knowledge and skills. Hand-stitched footballs accounted for a handsome share of Pakistani exports. But it was the 1982 FIFA World Cup that turned things around. Sialkot made football, “Tango” was first time used in the world cup (Atkin et al., 2014). The unmatched quality of hand-stitched footballs made Sialkot worldwide famous and spawned the way for the football industry’s unprecedented growth in Pakistan. Pakistan produced footballs for the 2014 FIFA world cup held in Brazil, and the ball was labelled “Brazuca” (Atkin et al., 2017). Pakistan also provided hand-stitched footballs in the 2012 Olympics (Atkin et al., 2014; Hassan & Nosheen, 2020). The latest destination of this football has been Russia, where Pakistani-produced footballs “Telstar 18” and “Telstar Mechta” were used in the football world cup 2018 (FIFA, 2018). According to media reports, Pakistan is once again going to produce the football named "Al-Rihla" for FIFA world cup to be held in Qatar in 2022 (News, 2022).

Despite challenging political conditions, energy shortages, and international standards, Pakistan’s football industry has shown consistent performance over many years and has a competitive advantage over its global counterparts. Pakistan’s hand-stitched footballs have been the finest quality and the toughest in use (Lund-Thomsen et al., 2012). The stitch of Pakistani workers can endure the kick of the world’s top footballers. Though the industrial and the electronic revolution have robotized and mechanized every industry, Pakistan’s handmade footballs are still a class apart. The city of Sialkot in Pakistan caters to more than 70% of the total world demand for hand-stitched inflatable footballs. It supplies leading global brands like Reebok, Nike, Mitre, and Adidas (GoP,
This amounts to around 40 million footballs annually worth US$ 210 million. It is believed that the world’s 60 percent of the total hand-stitched football production is carried out in Sialkot, which accounts for 39 million footballs per annum (SMEDA, 2018). According to Venables (2015), 70 percent of the world’s hand-stitched footballs were produced in Sialkot.

During the peak season, which repeats after every four years on the occasion of the FIFA World Cup, the production of footballs exceeds 60 million per annum. These footballs are produced by a workforce of around 60,000 workers (GoP, 2015). The city’s availability of skilled labor results from long-held tradition and football manufacturing history (along with other sports goods). For firms of Sialkot, their intangible resources are past knowledge, competence, and experience in this field. These resources have become the critical success factors in developing dynamic capabilities in football production and acquiring sustainable competitive advantage in the long run.

There is ever increasing demand for footballs globally. Several tournaments are played, and football producers have plenty of opportunities. 211 member football associations in 187 countries have around 128,983 professional players (FIFA, 2019). These figures are encouraging for football-producing countries like China and Pakistan. Pakistani workers are masters of hand-stitched football production. Hand-stitched footballs attracted the football world, and Pakistani workers have made it a unique and inimitable art. Over time, innovative technology seems to take over, but Sialkot remains the hub of football production. Now “thermal footballs” are being mass-produced. Firms of Sialkot have been competent enough to continually renew their capabilities, from hand-stitch to the latest thermal balls. Football firms have been able to sense and subsequently acquire new knowledge and transform their existing resources and capabilities to compete in the international market, termed dynamic capabilities. (Teece, 2007, 2015; Teece et al., 1997; Rehman & Ilyas, 2014) _ENREF_69.

Production of footballs can be divided into two categories: traditional hand-stitched and, second, the latest, thermal football production. Hand-stitched football production is labor-intensive and still in
use on a large scale. While thermal football is the latest technology, few firms have adopted this technology as this is capital intensive (UNIDO, 2008). The quality of hand-stitched footballs largely depends on the workers’ tacit knowledge and expertise in manual stitching. In contrast, the quality of thermal footballs depends on technological procedures and firm knowledge.

Consequently, hand-stitched football involves embodied knowledge (knowledge of practice), and thermal football requires embedded knowledge, that is, knowledge of technological processes. Both types of knowledge are essential in football production. Firms in Sialkot have gradually shifted to modern production technologies. They all have been producing hand-stitched footballs, so all know manual football production.

Hand-stitched football production started in Sialkot by repairing a punctured football more than a century ago (Chattha, 2011). Since then, it has never stopped. Over time, this art was refined and mastered by the workers. As per the area’s tradition, workers were added, and a skilled workforce was developed. These workers were the real craftsmen who relied on the knowledge and skills of the seniors. This craft has been transferred from generation to generation without being codified. This type of knowledge that is not codified is called tacit knowledge (Nonaka, 1994; Polanyi, 2012; Sheikh et al., 2014). The unique aspect of tacit knowledge resides with the knower and is transferred by the knower to the seeker. The craft and knowledge of hand-stitched football sewing is the most critical element of hand-stitched football production. Other than stitching or sewing the ball manually, lamination, cutting, and printing are the main stages of hand-stitched football production (SMEDA, 2018). Stitching is the last stage of the production process. With time lamination, cutting and printing have been improved, and technology has improved the quality of the material used. But the stitching remains the most critical and expert factor in this type of production.

Many workers are associated with hand-stitched football; they are called stitchers. There are no formal training centres where workers can get training for manual stitching, as the whole craft is the workers’ tacit knowledge. The art is each worker’s implicit capital, which is transferred to the next
worker. As football production started in this area before the creation of Pakistan in 1947, after the partition, many business owners migrated to India (Chattha, 2011). But the knowledge of hand-stitched football production was retained in Sialkot, what (Giuliani, 2003) termed as knowledge in the air. Though migrated business people developed a football cluster in the Indian city Jalandhar, it could not compete with the Sialkot cluster as Sialkot had a large workforce with tacit knowledge of football production (Chan et al., 2015). Over 131 years, without having any formal training centres to train hand-stitched football production, Sialkot remains the hub of hand-stitched football production.

Research Question

What are the core competencies of Pakistani firms?

How do Pakistani firms acquire, share, and renew the unique knowledge of football production?

Research Methodology

The current study has focused on Pakistan to explore football-producing firms’ knowledge management processes. Only one city Sialkot in Pakistan caters to the significant demand for footballs globally (ET, 2014). This city has a long history of football production, making it a unique case to study. All football types are being produced here, so focusing on one city for this study is sufficient to discover the underlying knowledge management processes.

Research Approach

The current study focuses on exploring knowledge acquisition and sharing strategies in the football industry, so this study follows an inductive approach. As this is a qualitative study, its philosophical foundation is interpretivism (Denzin & Lincoln, 2018). It has been done in a natural setting, and a key instrument has been the researcher who listened to the informants’ interpretations in a specific context.

Research Strategy
The strategy choices are the experiment, survey, case study, action research, ethnography, archival research, and grounded theory. To answer a research question, a specific research strategy must be delineated, which is an actual plan of the research study (Denzin & Lincoln, 2018; Saunders et al., 2019; Sekaran & Bougie, 2019). This is an exploratory study whose primary objectives pertain to exploring knowledge management processes at the firm level. Exploratory studies are flexible and in-depth in nature (Sekaran & Bougie, 2019).

In this study, grounded theory has been used. Glaser and Strauss (1967) define grounded theory as a systematic discovery of theory from data, that is, theory grounded in data. According to Charmaz et al. (2017), “grounded theory is a flexible, systematic, comparative method of constructing theory from data” (p.720). There are four basic principles of grounded theory: the researcher’s mind is free from preconceived notions about the research problem, simultaneous data collection and analysis, welcoming the variations, and a close look at data analysis for theory generation (Charmaz, 2008).

Social scientists have generally been involved in testing and verifying existing theories, and they seldom pay heed to generate new theories. Glaser and Strauss (1967) emphasized the need to develop or discover new theories, specifically in sociology. They prefer grounded theory using the inductive approach to a theory generated based on deductive logic applied to existing theories. The primary purpose of using grounded theory is to generate emergent middle-range theory (Charmaz, 2008; Charmaz et al., 2017). Theory serves various purposes like prediction and explanation of behavior, theoretical advancement, helping the practitioners, behavioral perspective, and providing research guidance in particular behavioral areas (Glaser & Strauss, 1967).

Many researchers have used the grounded theory to discover new phenomena or build a theory; for example, Nag and Gioia (2012) used grounded theory in their research in the steel industry to know the patterns of knowledge search and creation. Oktay and Walter (1991) used the grounded theory approach to understand the experiences of daughters of women with breast cancer, and they came up with unique themes by using grounded theory. Others like (Eisenhardt et al., 2016; Eury et al., 2018;
Gioia, 2019; Gioia & Hamilton, 2016; Patvardhan et al., 2015; Rheinhardt et al., 2018; Villena & Gioia, 2018) have used grounded theory. Hence, the use of grounded theory in theory development is evident from numerous studies. The best thing about grounded theory is that data come from those living the phenomenon under study; therefore, it is an inductive inquiry (Corley, 2015). Following the footsteps of Glaser and Strauss (1967), grounded theory has been used in this study. In this study, Gioia et al. (2013) methodology has been used. This approach is preferred due to its rigor and presentation of data structure (Gioia et al., 2013; Nag & Gioia, 2012). According to Gioia et al. (2013), it took them more than 20 years to refine and elaborate qualitative research methodology using grounded theory. This methodology comprises three steps (i) 1st order analysis, (ii) 2nd order analysis, and (iii) aggregate dimensions. The schematic diagram of 1st order concepts, 2nd order themes, and aggregate dimensions is called data structure (Gioia et al., 2013; Nag & Gioia, 2012; Patvardhan et al., 2015).

Method

In this study, data have been collected using semi-structured interviews. Since the purpose of the study is to explore the knowledge management processes like knowledge acquisition and knowledge sharing, only one data collection technique was sufficient. So, it is a mono method study, as primary data are collected using semi-structured interviews.

Time Horizon

The time horizon for this study is cross-sectional (Neuman, 2018; Sekaran & Bougie, 2003). As the research questions guide that this is not experimental research, data collected once were sufficient. The study is exploratory, and in such studies, the cross-sectional design is preferred (Bryman & Bell, 2015). Interviews of executives were conducted once, which served the purpose of this study.

Sampling Technique

A purposive sampling technique was used to select the firms. Purposive sampling is preferred as it allows researchers to include those subjects for data collection that best serve the research purpose
(Sekaran & Bougie, 2003). Only those firms whose primary business (at least 80%) was football manufacturing were included in the study. Some government and private organizations have data on the firms in Sialkot. These include The Sialkot Chamber of Commerce & Industries, Small and Medium Enterprises Development Authority, Trade Development Authority of Pakistan, and Pakistan Sports Goods Manufacturers and Exports Association. All these organizations have overall cluster data regarding sports goods production in Sialkot. Specific data regarding football producing firms and, more importantly, a valid list of football producers is not available. A reliable sampling frame could not be determined, and any probability sampling technique was not viable. However, industry experts guided regarding football producing firms, and of course, some firms are internationally famous for producing footballs. These firms were contacted.

Sample Size

Grounded theory has its unique way of determining the number of informants to be accessed. In grounded theory, data collection and analysis are a cyclic process (Timonen et al., 2018). Sample size in grounded theory depends on theoretical saturation (Corley, 2015; Dougherty, 2017; Patvardhan et al., 2015). Theoretical sampling is a non-probability purposive sampling technique (Bell et al., 2018). Steinar (2007) argued that for a qualitative research study, a sample of 15±10 is sufficient. In this study, data were collected from 15 managers/CEOs, data saturation decided the end of data collection. After seven interviews, themes and categories started to repeat, this continuous repetition provided the reason to stop further data collection.

Data Collection

Data collection is the most crucial part of the research, mainly qualitative research. Contacting the informants and getting permission/consent for the interview is essential. Before entering the field for data collection, an exploratory interview was conducted with an entrepreneur exporting hand-stitched footballs for almost 30 years. He provided valuable information about the processes of hand-stitched
football production and the workers who are called stitchers. This information helped in delineating the interview protocol. This interview helped prepare for primary data collection.

Access to the football firms was not easy; a Sialkot Chamber of Commerce & Industry (SCCI) member facilitated access to football manufacturing firms. Due to these contacts, access to the two largest firms in Sialkot was made possible. One firm was the provider of footballs in the last two world cups (2014 & 2018). The second firm was the largest producer of hand-stitched footballs in Pakistan. Another large firm was producing machine-stitched and hand-stitched footballs. The rest of the firms were small or medium-sized firms. A total of 35 firms were contacted, out of which 15 firms agreed to participate in the research study and gave access to their premises for interviews. Table 1 provides the information regarding the firm type and products. According to SMEDA 2007 policy, a firm with more than 249 employees is considered a large firm, a firm with 50 to 249 employees is a medium-sized firm, and a firm with less than 50 employees is a small firm (Dnish & Khattak, 2020). It is important to note that all three types of firms are included in the sample.

### Table 1. Firm Profile

<table>
<thead>
<tr>
<th>Firm</th>
<th>Type</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm 1</td>
<td>Large</td>
<td>Thermal/Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 2</td>
<td>Large</td>
<td>Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 3</td>
<td>Large</td>
<td>Hand-Stitched /Thermal Footballs</td>
</tr>
<tr>
<td>Firm 4</td>
<td>Large</td>
<td>Hand-Stitched /Machine-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 5</td>
<td>Medium</td>
<td>Hand-Stitched /Machine-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 6</td>
<td>Medium</td>
<td>Hand-Stitched /Machine Stitched Footballs</td>
</tr>
<tr>
<td>Firm 7</td>
<td>Medium</td>
<td>Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 8</td>
<td>Medium</td>
<td>Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 9</td>
<td>Small</td>
<td>Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 10</td>
<td>Small</td>
<td>Machine-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 11</td>
<td>Small</td>
<td>Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 12</td>
<td>Small</td>
<td>Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 13</td>
<td>Small</td>
<td>Machine-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 14</td>
<td>Small</td>
<td>Hand-Stitched Footballs</td>
</tr>
<tr>
<td>Firm 15</td>
<td>Small</td>
<td>Hand-Stitched Footballs</td>
</tr>
</tbody>
</table>

### Data Analysis

Table 2 provides the information on Managers/CEOs; 15 interviews were conducted. The first interview was done with the owner and CEO of the top firm in the football industry; this interview
lasted around two hours. This was a comprehensive interview, as the interviewee provided lots of information. Rich data were collected and analyzed; many categories and themes emerged. After this, a second interview was conducted; categories/themes that emerged from this interview were compared with the first one for constant comparison. The same procedure was repeated till the data saturation was achieved.

Table 2: Demographics of Executives

<table>
<thead>
<tr>
<th>Informant</th>
<th>Gender</th>
<th>Age</th>
<th>Position</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>55 years</td>
<td>CEO/Owner</td>
<td>30 years</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>49 years</td>
<td>CEO/Owner</td>
<td>17 years</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>40 years</td>
<td>Product Manager</td>
<td>23 years</td>
</tr>
<tr>
<td>4</td>
<td>Male</td>
<td>46 years</td>
<td>GM production</td>
<td>20 years</td>
</tr>
<tr>
<td>5</td>
<td>Male</td>
<td>48 years</td>
<td>GM admin</td>
<td>14 years</td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
<td>35 years</td>
<td>Production Manager</td>
<td>15 years</td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>37 years</td>
<td>Manager</td>
<td>15 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HR/Compliance</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Male</td>
<td>40 years</td>
<td>Owner</td>
<td>15 years</td>
</tr>
<tr>
<td>9</td>
<td>Male</td>
<td>38 years</td>
<td>Manager</td>
<td>10 years</td>
</tr>
<tr>
<td>10</td>
<td>Male</td>
<td>45 years</td>
<td>Owner/CEO</td>
<td>10 years</td>
</tr>
<tr>
<td>11</td>
<td>Male</td>
<td>60 years</td>
<td>Owner</td>
<td>37 years</td>
</tr>
<tr>
<td>12</td>
<td>Male</td>
<td>57 years</td>
<td>Production Manager</td>
<td>20 years</td>
</tr>
<tr>
<td>13</td>
<td>Male</td>
<td>58 years</td>
<td>GM</td>
<td>22 years</td>
</tr>
<tr>
<td>14</td>
<td>Male</td>
<td>30 years</td>
<td>Manager</td>
<td>07 years</td>
</tr>
<tr>
<td>15</td>
<td>Male</td>
<td>37 years</td>
<td>Son of Owner</td>
<td>05 years</td>
</tr>
</tbody>
</table>
New technology has almost made hand-stitched balls outdated. Production is now less labor intensive. Modern technology has affected the printing, cutting and improved the material used.

Thermal balls are better in quality and faster in production.

Customer demands and satisfaction have been raised. We can’t survive without technology now.

Yes we were well prepared for such changes. Not as such, but we attained know how only of MS. We adopted machine stitch which was not a big deal for us, we had experience of H/S. We were a little behind in terms of technology. Cut throat competition from China compelled us.

We had experience of H/S. MS is not much technical so adoption was not a big deal. Very helpful, as we built on our previous knowledge of hand stitched manufacturing. Basic learning and experience of H/S balls was very helpful, our knowledge of quality and material helped us.

Our experience is great help in Material testing, Product testing, R & D. It has a key role; otherwise we have to invest extra resources to develop skills.

Skilled Workforce

I visit abroad frequently, talk to knowledgeable people. International exhibitions. I participate in technology and trade fairs. Internet, Social media like YouTube. Also take ideas from other industries. I visit my suppliers’ factories. Competitors are major source. Customers and FIFA updates.

My son became part of a research project of Adidas in UK.

This is a small city, workers often switch their jobs, so they carry the information with them and share it in new workplace.

Daily meeting of all managers with CEO & RnD Meetings- we give sample to our team then they develop on it. Customer feedback is taken and We have daily 02 meetings which include CEO, MD and top managers shared.

**1st order Concepts**

**2nd order themes**

**Aggregate key Dimensions**

- **Technological Changes**
- **Improved Quality**
- **Customer Expectations**
- **Change adaption**

**Strategic Position**

**Core Competence**

**Knowledge Acquisition & Strategic fit**

**Knowledge Sharing**

**Executive Scanning**

**Knowledge Collaboration**

**Sharing routines**

**Knowledge Spillover**
Figure 1 shows the data structure of the interviews of Managers/CEOs. They were asked: How has the new technology of football manufacturing affected the traditional hand-stitched football industry? And “Were you prepared for changing technologies (from hand-stitch to machine-stitch and thermal footballs)”?

Figure 1 presents the data structure of the analysis against the above questions. Five second-order themes emerged from data: technological changes, improved quality, customer expectations, change adaption, and core competencies, which are discussed below.

*Technological Changes* comprise automation & process efficiency and, cost efficiency & mass production.

*Automation & Process efficiency*: with changing technologies, processes have been improved. Automation has made this industry less-labor dependent, which once used to be highly labor-intensive. Costs have been reduced. For example, one CEO narrated:

“We were able to finally develop such an indigenous machine that was perfect for football, now only 11 workers handle large lamination work instead of 250, this not only cut the cost but also made the job more quality-focused with high speed”.

Automation has taken place in almost all football production processes, from lamination and cutting to stitching; new innovative machines are now available. It seems that in the future, we might see the robotization of football production.

*Cost-efficiency & Mass Production* with automation and improved processes, one crucial aspect has been significantly improved ‘the cost of production.’ Cost is an essential factor to remain competitive in the international market. Pakistan is facing tough competition from China, India and Thailand. The cost has been reduced with automation and innovative methods of production.
Improved quality is the outcome of continuous technological and process improvements. The lamination, cutting, printing, and manual stitching operations have been improved. The firms which are not producing hand-stitched balls have improved all the processes and have shifted to more automated processes.

Customer Expectations These process improvements and quality assurance practices are not isolated; the customers have forced the producers to provide quality footballs. Bulk buyers like Adidas have high bargaining power; they demand quality and quantity within the stipulated time. These demands are tough to meet without innovative and out of the box approaches. Today’s buyers have become more quality conscious than ever; increasing competition from China has drastically forced the firms to improve quality. Another factor responsible for the higher bargaining position of buyers in the football industry is the monopoly of few brands and the absence of Pakistani brands in the international market.

Change adaption generally, firms were aware of the changes in the external environment on the technology front. They knew that things were changing; machine-stitched balls are cheaper to prepare as they are less labor-intensive, and mass production is possible, further lowering the cost. But the quality of machine-stitched balls is lower than hand-stitched balls. Keeping all such issues in mind, this is surprising; they were much behind in technology and least interested in innovations as they had fallen prey to “active inertia” (Sull, 2005). As added by one CEO, they remained slow, “pace of change of technology is too high in every industry, and our businessmen have not been able to cope with the pace and are facing issues”. But with learning, they managed to develop the most advanced form of football, the thermal ball. Though most firms were able to change, some firms were late in technology adaptation (Atkin et al., 2014). These firms suffered a lot from their Chinese competitors; as one manager said “Not really, we were a little behind in technology. Cut-throat competition
from China compelled us, though we managed to catch up late. We had lost a significant market share to Chinese competitors. Now we are ahead of them.”

These firms had to decide on “Change or Perish” to remain competitive. China had a competitive edge over Pakistani firms regarding technology and volume production. However, later on, these firms accepted that things had changed and traditional production methods would not be handy anymore. So, the competition forced these lagging firms to catch up and regain their market share. Whether the changing technology adaption was forced or proactive, this required many efforts from Pakistani firms. They had also lost their market share, which was a daunting task. Pakistani firms worked hard to build on their initial knowledge of football production.

They updated their knowledge by *internal development* as they had no other option. Internal development involves developing their existing capabilities (Johnson et al., 2008). They improved their current production processes, adopted machine stitching, and improved the quality of the final product to qualify to be considered the suppliers of football for the big buyers. The experience of manual stitching in acquiring new technology was beneficial for Pakistani firms; manual football production has been their core competency.

“Core competencies are the skills and abilities by which resources are deployed through an organization’s activities and processes such as to achieve competitive advantage in ways that others cannot imitate or obtain” (Johnson et al., 2008, p.67). A core competency of these firms is the production of hand-stitched football. Over time things changed, technology overtook many manual processes, but initial knowledge of hand stitching remained there. Whatever they developed or built was based on previous knowledge they held for decades. This path dependence was their lens to approach new challenges. This core competency was helpful to remain competitive. Capabilities are a mix of resources, activities, and processes an
organization possesses. Though working on traditional methods, Sialkot firms learned new means and adapted technology, some of them were quick, and some were slow to adapt.

But interestingly, they managed their international competitors. Firms in Sialkot have competencies that are specific to this area. They carry a century-old tradition and knowledge of football manufacturing, rare in other parts of the world. They have expertise in graphics, designs, skill, and quality of hand stitching, and above all, they have a skilled workforce; these are the “basics” in this industry to survive and remain competitive.

Their capabilities enabled them to learn new technology, innovative ways, and improve processes. Core competencies and capabilities of football firms helped them acquire new knowledge and maintain/regain strategic fit. These firms were lagging and lost a reasonable market share to their Chinese competitors. Core competencies of understanding the basics of football manufacturing helped them adapt to new technology and abandon old processes. Their learning capabilities made it easy and quick even to produce thermal footballs. New footballs have a microchip installed, providing all the relevant information. This is the latest innovation that has been quickly adopted by Pakistan football producers in FIFA world cup 2018.

Automation, cost-effectiveness, improved quality, customer expectations, and change adaption result from football firms’ external environment. As described by Johnson et al. (2008), “the strategic position is concerned with the impact on strategy of the external environment, an organization’s strategic capability (resources and capabilities) and the expectations and influence of stakeholders.” (p.13).

So the aggregate dimension is the strategic position of the firms. Firms have faced pressure from buyers and international and national competitors; thus, they have strengthened their resources and have enhanced their capabilities. Historically, Pakistani firms have been experts in hand-stitched football production, but with the changing environment and customer
expectations, they have shifted to machine-stitched and thermal football production. This shows that they have adjusted their strategic position to changing technologies and market demand. It is imperative to know how the Sialkot firms acquire new knowledge and remain updated regarding changes in the external environment, especially in technology and competition. When managers were asked this question, two critical second-order themes, Executive Scanning and Knowledge Collaboration emerged from the data analysis of their responses, which formed the aggregate dimension of Knowledge Acquisition at the firm level.

“Executive Scanning” is a vital factor leading to the knowledge acquisition of the firms. Due to its importance, each 1st order concept has been given a particular name in the following discussion.

Executive scanning consists of several activities: event scanning, cyber scanning, industrial scanning, suppliers scanning, competitors’ scanning, and FIFA updates.

Event Scanning is how firms get updated knowledge by visiting related events. These events include seminars, trade fairs, and exhibitions. Knowledgeable people and industry experts are available to share their views. As one owner said:

“I visit abroad frequently, participate in technology and trade fairs regularly, especially in Germany (which he thinks is an advanced country to get such knowledge), talk to knowledgeable people.”

“Adidas organizes an annual summit of suppliers, an excellent forum to talk to experts and get some information about changing technological and sports trends.” Added by a top manager. Most executives visit internationally; these visits are the source of information and find buyers of their products. The structure of these firms is either sole proprietorship or family-owned, so most owners visit abroad and look for information around.
Cyber Scanning is net surfing, and looking for new updates is social media like YouTube and others. Nowadays, access to information is unrestricted. Anything happening anywhere is accessible to the whole world within seconds. The world has become a global village and converted into a “Knowledge Village” by Information Communication Technology (ICT). This is a cheaper means to access updated information by anyone anywhere. These firms are astute enough to take advantage of ICT.

Industrial Scanning firms are also scanning related industries. Some areas are common; for example, rubber/plastic manufacturing is associated with football. They are also linked with the cutting and printing of material. Such similarities in products and operations open the ways of thinking out of the box. As one CEO explained, “I also take ideas from other industries and apply them in ours.” This executive scanning makes things easier for the firms to remain updated in the national and international industry and earn a competitive advantage.

Suppliers’ Scanning Synthetic leather and rubber are mainly used in football production. The firms often visit suppliers of these raw materials; some clever football manufacturers have a close eye on the production processes of their suppliers, thinking about backward integration. As expressed by one owner, “I visit my suppliers’ factories to see how they work; I observe and take important information.” When asked why they would give you access to their processes, he smiled, winked, and said, “well, you know they are suppliers of raw material; I ask them to show me their production facilities so that I may assure quality myself…and that’s enough to get access”. I also give access to my clients like Adidas, so the same is tried on my suppliers.

Working with suppliers can lead to innovative breakthroughs as well; he gave another example of his innovative breakthrough:
“Almost 10-15 years ago, Germany announced it would not accept footballs produced by PVC material as the material was not environmentally friendly and as hazardous. I accepted the challenge, but it proved too difficult; none of the Pakistani chemical suppliers was ready to invest in RnD to develop such a material. I joined hands with a Thai company and successfully developed the dreamed material. We made an agreement of 10 years with that company. German labs tested our material up to their satisfaction, and after 312 trials, they confirmed the quality of the material. This one innovation ousted India from Germany, producing millions of football for Europe. I enjoyed the monopoly for almost ten years."

*Competitors’ Scanning* There are national and international competitors competing for a few buyers. Whenever any new development is heard, these firms try to learn what is there in the market. One commonly used strategy is buying competitors’ products and taking them into their lab to analyze the quality and material used. “Competitors are major source; we do buy balls of our competitors and at times reverse engineer these,” told a manager.

*FIFA and Customers* As football-producing firms in Sialkot don’t have football brands, they rely on their customers. The sophistication and quality required by the big customers become a compulsion for the manufacturers to meet. These big buyers provide design and quality specifications which become mandatory for the producers. To achieve the standards, firms do their best in innovation and production. Some companies like Adidas gather technical people from around the globe in one place. As mentioned by an owner, “Adidas organizes an annual summit of suppliers, which is an excellent forum to talk to experts and get some information on changing technological and sports trends.”

According to the official website of FIFA “The FIFA Quality Programme sets internationally recognized industry standards for products, technologies, and surfaces that directly impact the game of football.” As per the quality manual of FIFA 2018, three types of football samples are required by FIFA, which include QUALITY PRO, FIFA QUALITY, and IMS. For these
samples, dimensions of circumference, sphericity, shape/size, water absorption, and balance are tested at different levels for each sample. These strict criteria make it very difficult for any ordinary firm to meet. Only a few firms can meet these criteria.

So FIFA updates regarding the quality of football set targets which lead to innovation in the firms. As reported by Shinkai et al. (2007) maximum ball reaction force calculated in their experiment is $2847 \pm 538$ N, so it requires a football to endure high power impact. According to one firm, a football is tested for 3500-5000 kicks by a machine with a speed of 50 km per hour. The balls are tested for almost 95% humidity and at 60 degrees Celsius, which are extreme quality assurance tests.

The next second-order theme is knowledge collaboration, discussed below.

**Knowledge Collaboration** Firms have collaborated internationally to acquire new knowledge. As narrated by the CEO of the firm:

“My son was studying in Leicester, doing MSc in production, there, Adidas was researching to develop a smart ball that could have a chip in it that would have been used to measure the pressure of kick of the players. A professor was conducting these experiments for Adidas; students were hired to assist the professor, including his son. My son got access to the latest technology (which he passed to his father). His company helped these experiments by developing a football that could have a chip in it; this was a hand-stitched ball produced by his company, then he also developed a football with reflectors, he developed a football with foam as well, which could have placed chips. He also prepared a see-through football so that scientists could meticulously check the ball movement and pressure of the kick. These developments were impressive for the professor and Adidas; He was also invited to UK; this spawned the way towards penetrating the arenas of technology.”
Firms can build on their existing knowledge, and this know-how and expertise are beneficial when they get any chance to collaborate internationally. Footballs with the chip have been successfully tested and used in FIFA 2018 World Cup held in Russia. This one opportunity got by this firm provided unprecedented opportunities for research and development with advanced technology. His son provided the professor with a chance to get the football developed by a firm that was an expert in this area. This mutual collaboration proved mutually beneficial in research and development.

Executive scanning coupled with Knowledge collaboration activities leads to an aggregate dimension called “Knowledge Acquisition.” This knowledge is then unique and a source of competitive advantage for the firms because this knowledge is rare, inimitable, and valued. Now on both fronts, whether it is hand-stitched football or the latest technology football, this knowledge has given a clear advantage to Sialkot firms. Knowledge acquired through executive scanning or collaboration must be shared within the organization. When were firms asked how knowledge sharing takes place? Two 2nd order themes emerged: sharing routines and knowledge spillover and formed the aggregate dimension of knowledge sharing.

The firms use this knowledge for internal learning, which consists of the deliberate efforts of firms to enhance their learning. High-ups meet their staff to discuss and share the new developments and the changes taking place in the industry. “Meetings with high-ups on Wednesdays, we discuss and experiences are shared.” is one example of knowledge sharing. One manager said, “we meet daily and discuss the issues”. Some firms have set targets to move ahead of others to remain competitive. So these are the sharing routines of the firms.

Firms have adopted formal and informal meetings as a strategy to share the knowledge related to their business. Top managers, CEOs, or owners of the organizations head these meetings; they are the people who frequently visit other firms and participate in trade fairs, exhibitions, and annual meetings, so they are the information scanners for their firms. They
also take the responsibility to share the information and updated knowledge with relevant people of the firms.

These meetings are the knowledge sharing routines of the firms; as told by one senior manager, “we have a daily meeting of all managers with CEO and R&D people.” Another manager reported, “in meetings - we give the sample to our team then they develop on it.”

This face to face interaction seems the most popular way of communication among the firms in Sialkot, as explained by a CEO “We have daily 02 meetings which include CEO, MD and top managers (departmental heads) top managers guide their middle managers and so on, we are on the same page. These meetings are the real source of knowledge sharing, transfer and idea generation.” See how frequently they meet to discuss issues. But all these efforts explain tacit knowledge, no formal or coded knowledge transfer efforts.

Only 02 firms reported formal training and development of their human resources. Though informally they share their ideas and new developments, formal means are very important. This helps develop a system that all can benefit from. The firms that reported formal training and development processes were ahead of other technology and buyers. Knowledge sharing in football production is crucial; it used to be a static industry with changes taking place at a plodding pace. With the advent of technology, this industry is dynamic and requires “dynamic capabilities” to constantly renew knowledge, skills, and competence.

The government is also taking some measures to build the capacity of these firms. One organization, Small and Medium Enterprises Development Authority (SMEDA), provides financial and expert help to some firms (SMEDA, 2018). SMEDA has set up the Sports Industries Development Centre (SIDC) near Sialkot. SIDC is providing its facilities for experimentation and offering training to production workers. This centre adds to the learning of firms associated with football and related businesses. This centre was also visited, and facilities being provided were observed. In Sialkot, firms are learning new techniques and
getting expertise with the help of capacity-building initiatives taken by the government and the internal development of the firms by self-learning (SIDC, 2021).

**Knowledge Spillover** As Sialkot is an industrial city with industrial culture, firms close down, new firms start, and workers keep on switching their jobs; this switch-over of workers also results in knowledge transfer. Workers with knowledge of stitching, cutting, lamination, color mixing, machine stitching, and thermal expertise are there, which Giuliani (2003) termed “Knowledge in the air.” The term “knowledge in the air” refers to the knowledge absorption or diffusion in cluster firms. Because of the physical proximity of firms, it becomes a source of localized collective learning (Giuliani, 2003). This knowledge of football is in the air of the city of Sialkot. Any development anywhere in any firm is available to all in a few days if not hours, as reported by one HR manager “This is a small city, workers often switch their jobs, so they carry the information with them and share it in the new workplace, information travels among all workers frequently and easily.” Football cluster is only in Sialkot, and this is not a big city, football producing firms are located not very far from each other, information travels quickly.

**Results and Discussion**

Figure 1 shows the data structure that emerged from the interviews of the executive informants. 03 aggregate dimensions emerged from these interviews: strategic position, knowledge acquisition and strategic fit, and knowledge sharing.

Figure 1 depicts that firms acquired knowledge to maintain a **strategic fit** using their core competencies and capabilities of hand-stitch manufacturing. In response to the changing environment, firms have upgraded their knowledge through internal development by renewing their capabilities (Schoemaker et al., 2018; Teece, 1987, 2018; Teece et al., 1997). Some firms could foresee the changing environment; others could not; proactive ones did not
lose their market share. The change was either forced by customers or proactively adopted by the firms, and hence internal development was the solution. Due to customer demands and expectations, companies had to meet the standards or be ready to perish. Firms can also build their capabilities by sensing, shaping, and seizing the environment’s opportunities (Felin & Powell, 2016), and some firms were able to do so.

Firms in Sialkot have to renew their capabilities by updating knowledge to remain competitive in the global market of football production. They must have been doing something to renew and upgrade their knowledge to remain in business constantly. Keeping this in view, executives were asked how new technology in football manufacturing has affected the traditional manual stitching industry? From the responses, the aggregate dimension that emerged was the current strategic position of the firms in Sialkot. Figure 1, describes the data structure of the effects of technology. Drastic changes have occurred in traditional football production, and technological changes have made hand-stitched balls look outdated. Manual production, which used to be highly labor-intensive, has become less labor-intensive. Modern technology has affected the printing and cutting processes and has improved the material used in football manufacturing.

Firms need to acquire updated knowledge to remain competitive and build a sustained competitive advantage. They get the latest information about the material, manufacturing processes and FIFA quality standards. This is being done by executive scanning and knowledge collaboration. The aggregate dimension “knowledge acquisition & strategic fit” was derived from the data. The senior manager, CEO or owner's knowledge is acquired through executive scanning. They participate in international trade fairs, and exhibitions (event scanning), closely monitor related industrial progress (industrial scanning), and remain active in cyberspace (cyber scanning). Executives also scan their external environment. Visiting the suppliers’ premises, buying competitors’ products, and learning from customers
are major knowledge acquisition sources. FIFA guidelines do play an essential role in strategic knowledge acquisition.

Sometimes they get chances to collaborate with international research centres. One of the firms collaborated for R & D with a centre in the UK and developed a technologically advanced football. Knowledge acquired through executive scanning and collaboration needs to be converted into organizational learning. Firms have used meetings of top managers with middle managers to share the latest updates of industry knowledge which is termed here as internal learning. Moreover, government organizations like SMEDA (Small and Medium Enterprises Development Authority) are also arranging training to update and educate the workers on new technology, called capacity-building measures.

Sialkot is not a big city, and workers share the firm's developments with other workers (knowledge secrets), knowledge and skills are present in the environment. And whenever workers shift their jobs (which they often do), they transfer this knowledge, and knowledge spillover is quite common.

If learning behavior of workers is further explored, it can be observed that firms are quite open for knowledge sharing, and they have made this activity their office routine, called sharing routine. Almost all managers have reported meeting daily once or twice to share all the information from technology to orders received to productions status. These routines are part of their organizational life. For advanced technical know-how, some firms have formal trainings. These trainings are their efforts towards Human Resource Development. One firm, the most advanced firm of all, reported that they make all the learning part of the system. Tacit knowledge is converted into coded knowledge, which becomes embedded knowledge of the firm. Since knowledge creation and innovation are crucial aspects of any industry, it was asked by the executives: “How does your firm acquire or create new ideas? Who is the most responsible for acquiring or creating new ideas?”
It was revealed that mostly this is the responsibility of executives; they are the influential incumbents to develop new ideas in technological advancement. There is a reason behind it. As these firms' structure is a family-owned business, most owners and top executives interact with the international environment; they get ideas and bring them to their firms. So, for new ideas, firms depend on executive innovation, the aggregate dimension.

There have been both positive and negative effects of technology on the traditional football industry. As far as hand-stitched football production is concerned, very little change in the stitching process is observed; only lamination and cutting processes have been improved. But the quality of hand-stitched is still far superior to machine-stitched footballs. So, old knowledge prevalence is visible. However, on the other hand, technology has revolutionized the industry in the case of thermal football production. Executives think that technology has overtaken hand-stitched football; technology has proved a game-changer in football, Effect is right there, so this is termed Tech-effects. Though thermal balls are getting popular, hand-stitched footballs' importance cannot be undermined. Still, many firms only produce hand-stitched footballs employing thousands of stitchers.

**Conclusion and Policy Implementations**

In Sialkot, Pakistan, football producing firms carry a century-old tradition of hand-stitched football making; this long history has given them some in-built advantages based on their core competencies. Firms' skilled labor force and innovative behavior have enabled them to compete internationally and beat their competitors. Quality and capacity of volume production have become the hallmarks of Pakistani firms. They produce the world’s best footballs in the required quantity. Two successive football production contracts for FIFA World Cups in 2014 and 2018 are evidence of Pakistani firms’ competence, dominance, and superior performance.
Based on the classic grounded theory of Glaser and Strauss (1967), the procedure proposed by Gioia et al. (2013) was used. The data structure for each question has been developed and discussed thoroughly. Due to their core competencies in football production, firms in Sialkot have built on their previous experience and technological innovations; their ability to adapt new technology and introduce lean manufacturing has given them a competitive advantage over other international competitors.

It has been explored how this cluster of football production in Sialkot is resilient to the dynamic and complex environment, which once used to be stable and certain. Before this study, Nonaka (1994) has given knowledge conversion spiral for the automobile industry. This study will help executives of the firms and the government of Pakistan address the issues of workers and industry to make it more sustained and profitable for the country. Hand-stitch workers are facing the threat of losing their jobs in future; this needs proper planning to protect the labor force of the industry.
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